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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/521,545	03/09/2000	Dale G. Swan	9896.145.0	2248

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EXAMINER
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CELSA, BENNETT M

ART UNIT	PAPER NUMBER
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1639

DATE MAILED: 05/15/2003

25

Please find below and/or attached an Office communication concerning this application or proceeding.

file copy

# Office Action Summary

Application No.

09/521,545

Applicant

Swan et al.

Examiner

Bennett Celsa

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Feb 14, 2003
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-9, 29, and 31-74 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-9, 29, and 31-74 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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**DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/14/03 has been entered.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Status of the Claims***

Claims 1-3, 5-9, 29, 31-74 are currently pending.

***Withdrawn Objection (s) and/or Rejection(s)***

Upon further consideration and in light of the new rejections recited below the following two rejections are hereby withdrawn:

- a. Claims 1, 5-9 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swanson et al. US Pat. No. 5,942,555 (8/99: filed 3/96) and Shi et al. US Pat. No. 5,919,626 (7/99: filed 6/97).

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B. Claims 1-9 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swanson et al. and Shi et al. as applied to claims 1, 5-9 and 29-32 above, and further in view of Kalal et al. US Pat. No. 4,332,694(6/82).

***Election/Restriction***

3. Applicant's election of Group I (claims 1-10) in Paper No. 9 (dated 7/13/01) is again acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

4. Applicant's further election of the compound  $\text{CH}_2=\text{CH}(\text{CH}_3)-\text{C}(=\text{O})-\text{O}-\text{CH}_2-\text{CH}-\text{O}-\text{CH}_2$  in Paper No. 13 (dated 10/15/01) which reads on claims 1-9 and 29-32 is acknowledged.. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

***Priority***

5. Applicant is claiming 35 USC 120 priority of the present application (09/521,545 filed 3/9/2000) as a CIP application to:

- a. 09/227,913 (1/8/99) (US Pat. No. 6,465,178)      or
- b. 08/940,213 (9/30/97) (US Pat. No. 5,858,653)

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It is noted that the presently claimed invention (e.g. claims 1-3, 5-9, 29, 31-74) does not comply with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

the disclosure of the invention in the parent application and in the continuing application must be sufficient to comply with the requirements of the first paragraph of 35

U.S.C. 112. See *In re Ahlbrecht*, 168 USPQ 293 (CCPA 1971).

A. Claims 1, 5, 8-10, 42, 52, 60, 67 (e.g. polyepoxide containing reagent composition with target-binding epoxy groups) are supported by the 09/227,913 (see patent 6,465,178; claims 1, 8, 9 and 16) BUT not the remaining claims which are drawn to specific embodiments not so described.

B. All of the present claims (e.g drawn to. polyepoxide containing reagent composition with target-binding epoxy groups and specific embodiments thereof) are not adequately described in 08/940,213 (9/30/97) (US Pat. No. 5,858,653) to demonstrate possession.

Accordingly, all of the claims (with the exception of claims 1, 5, 8-10, 42, 52, 60, 67) are denied 120 priority for purposes of prior art.

#### ***Discussion***

Applicant's arguments directed to the above priority issue were considered but deemed partially persuasive with regard to 09/227,913; but nonpersuasive with respect to 08/940,213 (9/30/97) (US Pat. No. 5,858,653) for the reasons described above for the 09/227,913

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application; and in light of the comments described below for 08/940,213 (9/30/97) (US Pat. No. 5,858,653).

Applicant argues that all of the individual features are *disclosed* by the '653 patent including "polymeric backbone", thermochemically reactive groups (a Markush group which includes epoxides) and supports which would enable one of ordinary skill in the art to make the presently claimed invention.

This argument was not found persuasive.

Initially, it is noted that question of enablement is not at issue.

With respect to written description it is well settled that something more than a suggestion is needed to satisfy the requirement for an adequate written description. As explained in *Lockwood v. American Airlines Inc.*, 107. F.3d 1565, 1571-1572, 41 USPQ2d 1961,1966 (Fed. Cir. 1997):

It is the disclosure of the applications that count. Entitlement to a filing date does not extend to subject matter which is not disclosed, but would be obvious over what is expressly disclosed ... a prior application itself must describe an invention, and do so in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention as of the filing date sought (Citations omitted).

It is not sufficient for purposes of the written description requirement of Section 112 that the disclosure, when combined with knowledge in the art, would lead one to speculate as to modifications that the inventor might have envisioned, but failed to disclose. Each application in the chain must describe the claimed features.

The disclosure of 08/940,213 (9/30/97) (US Pat. No. 5,858,653) lacks direct support for the invention as presently claimed nor are there examples (or patent claims) which would provide

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guidance to one of ordinary skill that applicant had possession of the presently claimed polyepoxides with target-binding epoxy groups.

***New Objection (s) and/or Rejection (s)***

6. Claims 1, 5, 8-10, 42, 48, 50, 52, 60 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duran et al. US Pat. No. 5,858,653 (1/99: filed 9/97) and Shi et al. US 5,919,626 (7/99: filed 6/97).

Duran et al. teach copolymers that comprise hydrophilic monomers (e.g. acrylic); pendant photoreactive groups (e.g. aryl ketones ie. for substrate covalent attachment) and a markush of thermochemical reactive groups, which can effect "target" (e.g. DNA) attachment, which include epoxides, although SH is preferred (e.g see col. 4, especially lines 4-20; col 7, especially lines 10-40; examples and patent claim 1).

The Duran et al. reference differs from the presently claimed invention by failing to specifically teach the selection of epoxides; and the amounts of the various components (claims 48, 50).

However, the Shi et al. Patent reference teaches that organosilanes (e.g. silanization) can be used to "tailor surfaces" (especially glass) with mercapto (SH) and/or epoxy groups" (e.g. see col. 5, lines 1-5) in order to permit the covalent attachment of "unmodified" oligonucleotides (e.g. see col. 7, especially lines 25-40) (emphasis provided).

Accordingly, one of ordinary skill in the art would be motivated to modify the Duran et al. reference composition to select an epoxy group, in lieu of an SH group to bind targets

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(especially oligonucleotides) in order to permit the attachment of the target (e.g. oligonucleotide) without derivation of the target, with a reasonable expectation of success since the Duran et al. reference composition and means of attachment of target compounds utilizes SH or other groups in the alternative to bind target compounds and uses similar (and in some cases identical) substrates (e.g. glass) for attachment of the reagent composition.

Thus it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify the Duran et al. reference reagent and method of attaching a target (e.g. oligonucleotide) by modifying the Duran composition to select epoxy groups (in lieu of an SH group) for use in applying to surfaces (e.g. glass) in order to realize the benefits therefrom such as the attachment of targets (e.g. oligonucleotides) without the need to modify the target (e.g. oligonucleotide) as taught by the Shi et al. Patent reference. Optimization to determine the amounts of the various monomers to form the copolymer is routine within the art.

7. Claims 1, 5, 8-10, 33-42, 48, 50, 52, 60 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duran et al. and Shi et al. as applied to claims 1, 5, 8-10, 42, 48, 50, 52, 60 and 67 above, and further in view of specification admission as to prior art on page 13 regarding publicly available diepoxide sepharose gel beads for binding nucleotides.

The discussion above as to how the Duran et al. and Shi et al. references combine to render claims 1, 5, 8-10, 42, 48, 50, 52, 60 and 67 obvious is hereby incorporated by reference in its entirety.



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The combined Duran et al. and Shi et al. reference teaching differ from the presently claimed invention (e.g. claims 33-41) by failing to teach the use of a pendent diepoxide instead of a pendent epoxide for binding a target (e.g. a nucleotide).

However, use of a diepoxide, instead of an epoxide pendent group would have been obvious due to the known modification of sepharose gel beads with diepoxides (e.g. Sigma) for use in binding oligonucleotides; thus ensuring functionally equivalent and a reasonable expectation of success. See specification prior art admission on page 13.

8. Claims 1-3, 5-9, 29, 31-32 and 42-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duran et al. and Shi et al. as applied to claims 1, 5, 8-10, 42, 48, 50, 52, 60 and 67 above, and further in view of Kalal et al. US Pat. No. 4,332,694 (1/82).

The discussion above as to how the Duran et al. and Shi et al. references combine to render claims 1, 5, 8-10, 42, 48, 50, 52, 60 and 67 obvious is hereby incorporated by reference in its entirety.

The combined Duran et al. and Shi et al. reference teaching differ from the presently claimed invention by failing to teach the use of monomers corresponding to specifically claimed polymeric epoxy group (e.g. present claims 2 and 3: glycidyl (meth)acrylate and  $H_2C=C(R_1)-X$ -epoxy).

However, Kalal et al. disclose epoxide containing (hydrophilic) polymers (e.g. glycidyl (meth)acrylate and  $H_2C=C(R_1)-X$ -epoxy; which include acrylate, methacrylates, vinyls see

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abstract; col. 2 especially lines 1-18 and 51-65; poly 2,3 epoxypropyl acrylate: see examples; patent claims, especially patent claim 8 ) which are within the scope of present claims. The Kalal et al. epoxide containing co polymer can be (and is ) adapted to be covalently attached to a "surface of a substrate" (e.g. inorganic porous materials such as glass, silica , asbestos etc.: see col. 2 and examples) and bind "targets".

Thus, it would have been obvious to one of ordinary skill in the art to at the time of applicant's invention to utilize the Kalal et al. polymeric epoxy groups in the Duran et al. reference teaching in order to arrive at polymeric epoxides within the scope of the presently claimed invention with a reasonable expectation of success since the Kalal polyepoxides are similarly used for the capture of target compounds.

### ***Double Patenting***

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground

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provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1, 5, 8-10, 42, 52, 60 and 67 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 (especially claims 1, 8, 9 and 16 ) of U.S. Patent No. 6,465,178 (10/02). Although the conflicting claims are not identical, they are not patentably distinct from each other because the patent claims teach copolymers that comprise hydrophilic monomers (e.g. acrylic); pendent photoreactive groups (e.g. aryl ketones ie. for substrate covalent attachment) and a markush of thermochemical reactive groups, which can effect "target" (e.g. DNA) attachment, which include epoxides the selection of which would have been obvious due to its preferred (claim) status.

11. Claims 33-41 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 (especially claims 1, 8, 9 and 16 ) of U.S. Patent No. 6,465,178 (10/02) in view of the specification admission as to prior art on page 13 regarding publicly available diepoxide sepharose gel beads for binding nucleotides .

The patent claims teach copolymers that comprise hydrophilic monomers (e.g. acrylic); pendent photoreactive groups (e.g. aryl ketones ie. for substrate covalent attachment) and a markush of thermochemical reactive groups, which can effect "target" (e.g. DNA) attachment,

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which include epoxides the selection of which would have been obvious due to its preferred (claim) status.

The Patent claims differ from present claims 33-41 by failing to specifically teach the use of a pendent diepoxide instead of a pendent epoxide for binding a target (e.g. a nucleotide).

However, diepoxide instead of epoxide pendent modification would have been obvious due to the known modification of sepharose gel beads with diepoxides (e.g. Sigma) for use in binding oligonucleotides; thus ensuring functionally equivalent and a reasonable expectation of success. See specification prior art admission.

***Outstanding Objection (s) and/or Rejection (s)***

12. Claims 1-3, 5-8 and 52-57, are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kalal et al. US Pat. No. 4,332,694 (1/82).

Initially, it is noted that present claims are drawn to "product by process claims" which define the product by its method of making (e.g. screening). See MPEP 2113 directed to "Product by Process Claims". Even though product - by process claims are limited by and defined by the process, determination of patentability is *based on the product itself*. The patentability of a product does not depend on its method of production. If the product in the product - by - process claim is the *same as or obvious from* a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). Once the Examiner provides a rationale

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tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292 (Fed. Cir. 1983). When the prior art discloses a product which *reasonably appears to be either identical with or only slightly different* than a product claimed in a product - by - process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." *In re Brown* , 173 USPQ 685, 688 (CCPA 1972)

Accordingly, Kalal et al. disclose epoxide containing (hydrophilic) polymers (e.g. acrylate, methacrylates, vinyls see abstract; col. 2 (especially lines 1-18 and 51-65; poly 2,3 epoxypentyl acrylate: see examples; patent claims, especially patent claim 8 ) which anticipates a composition within the scope of present claims 1 and 29. It is noted that intended use limitations are not afforded patentable weight (e.g. "for attaching a target molecule to the surface of a substrate"; "wherein the copolymer is attached to the surface of the substrate by formation of a covalent bond and the epoxy group can form a covalent bond with a target molecule". Further, it is noted that, since function flows from structure, the reference "reagent compositions", which comprise epoxy monomers and acrylic/vinyl monomers within the scope of the presently claimed

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invention, must possess, if not explicitly, then inherently, functions attributed to the presently claimed "reagent compositions" (e.g. ability to bind targets, covalently attach to substrate etc.)

Accordingly, the ability of the reference epoxy monomer-acrylate/methacrylate/ vinyl copolymers to attach to a substrate (covalently or otherwise), bind "targets"; as well as its method of manufacture; is not afforded patentable weight, or is alternatively, inherently present in the reference compositions..

However, the reference col. 2 and the reference examples appear to teach polymer epoxys within the scope of the invention (however synthesized) and also teach the intended use limitation of the epoxy containing copolymers to "attach a target molecule" (e.g. see col. 1, lines 55-65).

Similarly, although the method of making the polymer is not relevant to patentability if the prior art teaches a composition within the scope, the Kalal et al. reference nevertheless makes its epoxide containing polymers utilizing monomers within the scope of the presently claimed invention in which the copolymer can be attached to the surface of the substrate by a covalent bond (e.g. see col. 2; examples and patent claims). The Kalal et al. epoxide containing copolymer can be (and is ) adapted to be covalently attached to a "surface of a substrate" (e.g. inorganic porous materials such as glass, silica , asbestos etc.: see col. 2 and examples) and bind "targets".

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*Discussion*

Applicant's amendment and arguments address the anticipation rejection over the above Kalal et al. patent reference was considered but deemed nonpersuasive for the following reasons.

Initially, it is noted that the above rejection was rewritten as a 102/103 product by process rejection and further modified in response to applicant's claim amendments.

Applicant first argues that Kalal et al. does not teach or suggest that the monomer containing a pendant epoxy group is reacted with one or more diluent monomers/polymers selected from acrylics, vinyls, nylons, polyurethanes and polyethers.

Applicant's argument is not convincing since the Kalal polymers, which comprise epoxy monomers and acrylic/vinyl monomers within the scope of the presently claimed invention, are "reagent compositions" within the present claim scope, even though the prior product was made by a different process." See *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985).

Applicant next argues that the Kalal et al. reference teaches "a polymer is sorbed onto a porous substrate" and not "covalently attached to the substrate" as presently claimed.

This argument is not convincing, since, intended use limitations are not afforded patentable weight. Additionally, since function flows from structure, the reference "reagent compositions", which comprise epoxy monomers and acrylic/vinyl monomers within the scope of the presently claimed invention, must possess, if not explicitly, then inherently, functions attributed to the presently claimed "reagent compositions" (e.g. ability to bind targets, covalently

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attach to substrate etc. Additionally, col. 2 of the patent reference provides support for covalent attachment of the substrate as presently claimed.

Accordingly, the above 102/103 rejection, as modified, is hereby retained.

13. Claims 1-3, 5-8 and 52-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalal et al. US Pat. No. 4,332,694 (1/82) and Shi et al. US 5,919,626 (7/99: filed 6/97)..

The above discussion in the 102/103 rejection of the Kalal reference is hereby incorporated by reference in its entirety.

The Kalal et al. reference composition differs from the presently claimed invention by failing to teach the target being a nucleic acid to directly attached underivatized nucleic acid and the use of silanized glass containing epoxides.

However, the Shi et al. Reference teaches that epoxy groups can directly bind unmodified nucleic acids as targets; and additionally, the preferential use of polymerized epoxides on silanized glass surfaces.

Accordingly, one of ordinary skill in the art would be motivated to modify the Kalal et al. Reference method to employ nucleic acids as targets for attachment to polymeric epoxides as disclosed in Kalal et al. And the further use of silanized glass for the benefits obtained therefrom (e.g promote N.A. attachment) as taught by the Shi et al. Reference.

Thus, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify the Kalal et al. reference composition to utilize unmodified



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nucleic acids as target compounds and silanized glass for the benefits obtained therefrom as taught by the Shi reference.

14. Claim 1-3, 5-9, 29, 31-32 and 42-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalal and Shi as applied to claims 1-3, 5-8 and 52-57 above, and further in view of Swanson et al. US Pat. No. 5,942,555 (8/99: filed 3/96)..

The above obviousness rejection over Kalal and Shi is hereby incorporated by reference in its entirety.

The Kalal and Shi reference teaching differ from the presently claimed invention by failing to teach the use of pendent photoreactive groups (e.g. aryl ketone/azides) attached to the polymer backbone to (covalently) attach the polymer to surface.

However, Swanson et al. teach chain transfer agents (e.g. Yi-X-SH: see col. 5) that comprise:

- a. Y is an organic radical(s) comprising one or more photoactivatable groups (e.g. aryl ketones, benzophenones are preferred: see col. 5);
- b. X is an optional spacer (see col. 6-7); and
- c. SH.

The Swanson photoactivatable chain-transfer groups can be used in a variety of polymerization (including copolymerization: see col. 13, lines 38-50)) reactions that employ chain-transfer agent (e.g. see col. 7). *Accordingly, the chain transfer groups can be used as photopolymers, including*

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*the simultaneous or sequential attachment of the polymer to a support surface (e.g. see col. 13, especially lines 1-10 and lines 50-top of col. 14), including silylated surfaces of glass, ceramic or metal as well as plastics (e.g. see col. 13, lines 25-38) (emphasis provided). Swanson teaches the use of diluent hydrophilic monomers for polymerization which are within the scope of the present invention (e.g. see col. 3,7-8). The Swanson photopolymers can be used to "immobilize desired molecules onto the surface" (e.g. see col. 14, lines 5-11) including the attachment of protein and nucleic acid targets (e.g. see Examples, especially examples 14 and 33-35).*

Accordingly, the Swanson reference provides motivation to one of ordinary skill in the art to modify the Kalal reference polymer epoxy to further utilize pendent photopolymers for purposes of (glass/ceramic) surface attachment.

Thus, it would have been prima facie obvious to one of ordinary skill in the art at the time of applicant's invention to modify the Kalal reference polymeric epoxy compositions to incorporate pendent photoreactive groups (e.g. aryl ketone/azides) for the benefit of achieving surface attachment of the Kalal polymeric epoxy composition. Optimization to determine the amounts of the various monomers to form the copolymer is routine within the art.

**General information regarding further correspondence**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Celsa whose telephone number is (703) 305-7556.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew J. Wang (art unit 1639), can be reached at (703)306-3217.

Any inquiry of a general nature, or relating to the status of this application, should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Bennett Celsa (art unit 1639)

May 14, 2003

BENNETT CELSA  
PRIMARY EXAMINER

